

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
17 July 2003 (17.07.2003)

PCT

(10) International Publication Number
WO 2003/058172 A3

(51) International Patent Classification⁷: G01D 5/245, 5/249

(74) Agents: JACKSON, John, Timothy et al.; Renishaw plc, Patent Department, New Mills, Wotton-Under-Edge, Gloucestershire GL12 8JR (GB).

(21) International Application Number:
PCT/EP2003/000385

(22) International Filing Date: 13 January 2003 (13.01.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0200575.9 11 January 2002 (11.01.2002) GB

(71) Applicant (for all designated States except US): RLS MERILNA TEHNIKA D.O.O. [SI/SI]; C.II Grupe Odredov 25, 1261 Ljubljana-Dobrunje (SI).

(72) Inventors; and

(75) Inventors/Applicants (for US only): NOVAK, Janez [SI/SI]; Rozna Dolina C. VII/29, 1000 Ljubljana (SI). DOLSAK, Gregor [SI/SI]; Karlovica 2, Velike Lasce 1315 (SI).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

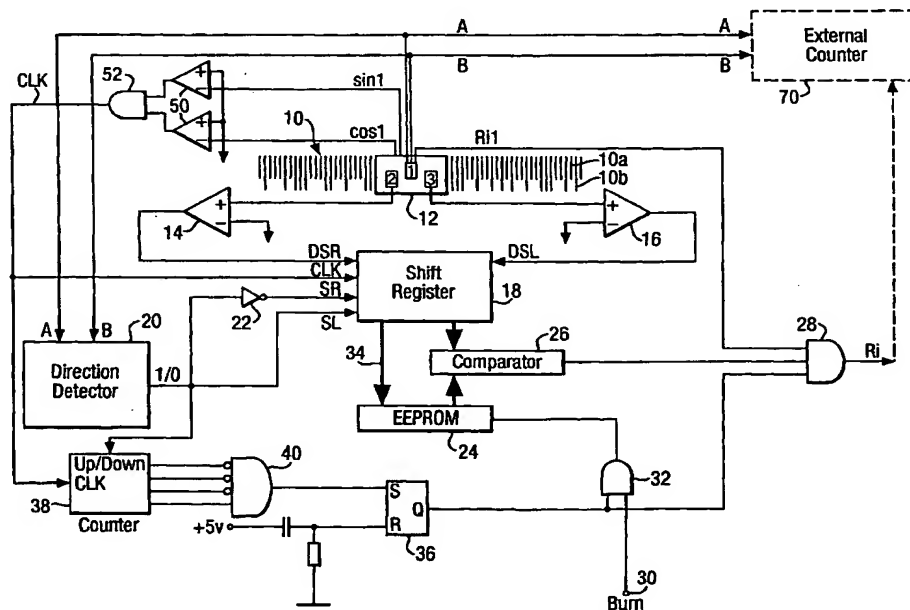
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv)) for US only

[Continued on next page]

(54) Title: ENCODER WITH REFERENCE MARKS



(57) Abstract: A scale (10) has magnetic incremental scale marks in a track (10a), and a pseudo-random code sequence in a reference mark track (10b). Sensors (2, 3) feed the pattern of the code in the track (10b) into a bi-directional shift register (18). So that a user can select any desired position for use as a reference mark, a memory (24) is provided, into which any selected code value can be pre-stored. A comparator (26) then compares the code value in the shift register (18) with the code value in the memory (24) and outputs a reference mark signal (Ri) when they match.

WO 2003/058172 A3



Published:

— with international search report

(88) Date of publication of the international search report:
8 January 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

 Interr — Application No
 PCT/EP 0000385

 A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 G01D5/245 G01D5/249

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

WPI Data, EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 545 701 A (HUGHES AIRCRAFT CO) 9 June 1993 (1993-06-09) abstract column 1, line 11 - line 14 column 3, line 21 - line 23 ---	1,2,4-10
Y	US 5 279 044 A (BREMER JOANNES GREGORIUS) 18 January 1994 (1994-01-18) column 2, line 60 - column 3, line 36; figure 2 ---	1,2,4-10
A	US 4 459 750 A (AFFA ALFRED) 17 July 1984 (1984-07-17) column 3, line 4 - line 49 -----	3

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the International filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the International filing date but later than the priority date claimed

- *T* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the International search

22 July 2003

Date of mailing of the International search report

28/07/2003

Name and mailing address of the ISA

 European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Lut, K

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internal publication No
PCT/EP 0 385

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0545701	A	09-06-1993	US 5239177 A	24-08-1993
			EP 0545701 A1	09-06-1993
			JP 5332789 A	14-12-1993
US 5279044	A	18-01-1994	DE 69222072 D1	16-10-1997
			DE 69222072 T2	05-03-1998
			EP 0503716 A1	16-09-1992
			JP 3308579 B2	29-07-2002
			JP 5071984 A	23-03-1993
US 4459750	A	17-07-1984	DE 3204012 C1	03-02-1983
			AT 35187 T	15-07-1988
			BR 8300547 A	08-11-1983
			EP 0085787 A2	17-08-1983
			JP 1793687 C	14-10-1993
			JP 4080323 B	18-12-1992
			JP 58146817 A	01-09-1983